A FLUID DISPENSER

CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit under 35 U.S.C. §119(e) of pending U.S. provisional patent application Serial No. 60/442,898, filed January 28, 2003, and priority under 35 U.S.C. §119(a)-(d) of French patent applications No. FR-02.13319, filed October 24, 2002 and FR-02.14753, filed November 25, 2002.

BACKGROUND OF THE INVENTION

The present invention relates to a fluid dispenser for dispensing fluid in liquid or powder form, the fluid dispenser comprising a fluid reservoir of variable volume and a dispensing orifice in communication with the reservoir so that fluid from the reservoir can be delivered through the dispensing orifice when the volume of the reservoir is reduced. The reservoir preferably has at least one wall that is deformable or movable to cause the internal volume of the reservoir to vary. Thus, by acting on said wall, it is possible to reduce the volume of the reservoir and thus to deliver fluid through the dispensing orifice. For example, such dispensers can be used in the fields of perfumes, cosmetics, or indeed pharmaceuticals.

For example, Document FR 2 791 645 describes a dispenser made up of two deformable sheets that are sealed together over their peripheries so as to define an internal volume defining a fluid reservoir. Advantageously, a dispensing part is fixed by sealing between the two sheets. The dispensing part advantageously defines a dispensing orifice and also serves as a support part for an element made of a porous material suitable for being soaked or impregnated with

fluid in liquid or powder form. In addition, the reservoir made up of the two flexible sheets contains a spring making it possible to return the two sheets to a configuration defining the maximum volume of the reservoir. That spring thus serves as a return spring which makes it possible to return the reservoir to its initial rest position in which it defines a maximum volume after each occasion on which the dispenser is actuated. The fluid reservoir contains a small quantity of the fluid and a larger quantity of gas, e.g. air. Thus, each time the dispenser is actuated, a mixture of air and of fluid is delivered through the dispensing orifice, and advantageously through the piece of porous material impregnated or soaked with fluid. In that document, provision is also made to close off the dispensing orifice by means of a removable closure member when the reservoir substantially contains fluid only, and when the spring is compressed to a state close to its maximum compressed state. Thus, so long as the removable closure member is in place, the reservoir is maintained at a minimum volume, and the fluid that it contains is substantially not in contact with air. It is only when the removable closure member is removed that the spring can relax so that the volume of the reservoir increases by means of air being drawn in through the dispensing orifice. Then, the dispenser is actuated by pressing on the flexible sheets that constitute the deformable actuating walls. Once pressure ceases to be applied to the sheets, the spring contained in the reservoir returns said reservoir to its initial maximum volume state.

The drawback with that prior art dispenser lies in the fact that the spring situated inside the reservoir acts on the actuating walls, i.e. on the flexible walls, even when the removable closure member is in place. This results in the flexible sheets being deformed locally,

which is not very attractive in appearance. In addition, when the spring is made of metal, it constitutes a large mass of metal inside the reservoir, which can be harmful to certain fluids. Furthermore, when the spring is made of a plastics material, it tends to lose its stiffness because of the tendency of plastics to creep over time.

SUMMARY OF THE INVENTION

An object of the present invention is to remedy the above-mentioned drawbacks of the prior art by defining a novel type of dispenser which does not need any permanent spring means to return the fluid reservoir to its rest position which defines the maximum volume. The dispenser can thus remain at rest with a reservoir volume that is much smaller than its maximum volume prior to dispensing.

Another object of the invention is to define a dispenser whose reservoir can increase in volume immediately before dispensing.

Another object of the invention is to make it possible to decrease the volume of the reservoir without squeezing the movable wall directly by hand.

Yet another object of the invention is to obtain a full dispensing cycle by means of a single continuous action.

To these ends, the present invention provides that the dispenser further comprises actuating means making it possible, in a first stage, to increase the volume of the reservoir by drawing air into the reservoir, and then, in a second stage, to reduce the volume of the reservoir by delivering air and fluid through the dispensing orifice. Advantageously, the actuating means comprise a press zone and a backing zone, the press zone being moved towards the backing zone generating an increase and then a decrease in the volume of the reservoir. Thus, by bringing the press zone closer to the backing zone, e.g.

by using the thumb reacting against the other fingers of the same hand, the dispenser undergoes a cycle which is not apparent to the user and in which the volume of the reservoir is firstly increased to draw air into it, and then the mixture of air and of fluid is delivered so that fluid is dispensed, advantageously in the form of a spray.

In an embodiment, the actuating means comprise a front flexible plate and a back flexible plate between which the reservoir is situated, the front plate being secured to the back plate at respective opposite edges so that bringing the opposite edges of the front plate closer together by said front plate flexing leaves the opposite edges of the back plate static relative to each other and leaves the back plate stress-free in said first stage, and then, in said second stage, brings the opposite edges of the back plate closer together by said back plate flexing with curvature going in the same direction as the curvature of the front plate, so that the two plates squeeze the reservoir between them. The flexibility of the plates serves as return spring means making it possible to return the dispenser to its initial rest state. It is the two plates being flexibly deformed in asynchronous and staggered manner that makes it possible to increase the volume of the reservoir in a first stage, and then to reduce it in a second stage during which both plates are curved in the same direction, thereby bringing the back plate closer to the front plate and thus reducing the volume between them and therefore the volume of the reservoir which is situated between them. In this embodiment, the front plate defines the press zone and the backing zone.

In a practical aspect, at least one edge of the front plate is provided with a flap defining a groove into which the corresponding edge of the back plate is

engaged loosely. Advantageously, the groove forms an abutment end-wall which, at rest, is separated from the respective edge of the back plate, so that the edge of the back plate comes into abutment against the abutment end-wall of the groove only after the edges of the front plate have come closer together to a certain extent. A single groove suffices when the front plate and the back plate are made integrally. However, when the two plates are separate, a groove must be provided at each of the opposite edges of the front plate.

In another aspect, the front plate has a curvature at rest that tends to become accentuated as the press zone moves towards the backing zone. The same may apply for the back plate with a curvature at rest that is less pronounced. Thus, it is guaranteed that the two plates bend with a curvature going in the same direction.

According to another characteristic of the invention, the front plate is provided with an opening at which the dispensing orifice of the reservoir is positioned. Advantageously, a pouch defining the reservoir, its movable wall and the dispensing orifice is disposed in fixed manner between the front plate and the back plate with the dispensing orifice positioned at the opening. In a variant, the front plate and the back plate form the reservoir.

In another embodiment, the reservoir contains a piece of porous material suitable for being impregnated with fluid, said piece being placed in contact with the dispensing orifice.

In another aspect, a removable closure member is initially positioned over the dispensing orifice so as to maintain the reservoir at a minimum volume, in which it substantially contains fluid only, the back plate then being pressed against the front plate.

In the same spirit, the present invention also provides a fluid dispenser for dispensing fluid in liquid or powder form, the fluid dispenser comprising a fluid reservoir of variable volume, said reservoir defining at least one movable wall that can be moved along a first axis to vary the volume of the reservoir, the dispenser further comprising a dispensing orifice in communication with the reservoir so that the fluid from the reservoir can be delivered through the dispensing orifice when the volume of the reservoir is reduced, said fluid dispenser being characterized in that it further comprises actuating means defining a press zone and a backing zone, it being possible to move the press zone towards the backing zone along a second axis transverse to the first axis. Advantageously, the press zone being moved towards the backing zone generates an increase in the volume of the reservoir. In which case, the actuating means comprise a front flexible plate and a back flexible plate between which the reservoir is situated, the front plate being secured to the back plate at respective opposite edges so that bringing the opposite edges of the front plate closer together by said front plate flexing leaves the opposite edges of the back plate static relative to each other, and leaves the back plate stress-free.

In a first aspect of the invention, the front plate defines the press zone and the backing zone at its opposite edges.

In another aspect which may be combined with the preceding aspect, the press zone moving towards the backing zone generates a reduction in the volume of the reservoir. In which case, the actuating means comprise a front flexible plate and a back flexible plate between which the reservoir is situated, the front plate being secured to the back plate at respective opposite edges so that bringing the opposite edges of the front plate

closer together by said front plate flexing brings the opposite edges of the back plate closer together by said back plate flexing with curvature going in the same direction as the curvature of the front plate, so that the two plates squeeze the reservoir between them.

The general inventive concept of the present invention lies in not acting directly on the movable wall of the reservoir so that it is possible to move it in one direction and/or in the opposite direction, i.e. to increase and/or to decrease the reservoir volume. Naturally, the most advantageous solution lies in increasing and then consecutively decreasing the volume of the reservoir. This general inventive concept results firstly in actuation that makes it possible to increase and then consecutively to decrease the volume of the reservoir, and secondly in actuation whose compression component is exerted between a press zone and a backing zone along an axis that is perpendicular to the axis along which the movable wall of the reservoir is moved.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described more fully below with reference to the accompanying drawings which give embodiments of the invention by way of non-limiting example.

In the figures:

Figure 1 is an exploded view of a fluid dispenser in a first embodiment of the invention;

Figure 2a is a vertical section view through the dispenser of Figure 1, in the assembled state, in the rest position, after the removable closure member has been removed;

Figure 2b is a view similar to the view of Figure 2a, during the initial actuating stage;

Figure 2c is a view similar to the view in Figures 2a and 2b showing the dispenser in the final actuating stage;

Figure 3 is a vertical section view through a dispenser in a variant embodiment; and

Figure 4 is a view similar to the view of Figure 3, for another variant embodiment.

DETAILED DESCRIPTION OF THE INVENTION

The embodiments used to illustrate the present invention and shown in the figures implement actuating principles which can be combined or implemented individually, but which are mutually related by a common general concept which lies in the fact that the pressing needed to move a wall of a fluid reservoir is not applied to said wall. In other words, the user does not act directly on the wall of the reservoir in order to move it, instead the user applies a force between a press zone and a backing zone that are situated outside the movable wall, so as to generate either an increase in the volume of the reservoir, or a decrease in the volume of the reservoir, or indeed a consecutive combination of an increase followed by a decrease, or of a decrease followed by an increase. These actuating principles are applicable more particularly but not exclusively to reservoirs forming or including a movable wall, i.e. a wall that can move, e.g. in a reservoir body, or a wall that is deformable relative to the remainder of the reservoir. For example, the movable wall may be in the form of a follower or scraper piston that is mounted to slide in leaktight manner in a drum-shaped reservoir. The deformable wall may, for example, be a flexible wall of a pouch, as it is in the embodiments shown in the figures.

Reference is made firstly to Figures 1, 2a, 2b, and 2c to explain the first embodiment of the invention. The fluid dispenser is a dispenser for dispensing a fluid that may be in liquid form or in powder form, and it comprises a fluid pouch given overall numerical reference 3, and handle and actuating means, formed in this example by two plates, namely a front plate 1 and a back plate 2. In this example, the actuating means also serve as covering means and as resilient return means for the fluid pouch 3.

The fluid pouch 3 is made up of two sheets 31 and 32 which are advantageously made of a material that is easily deformable. Naturally, it is possible to imagine that the two sheets 31, 32 may be connected together along one edge so as to form a single folded-over sheet. Each sheet defines a peripheral margin zone 310, 320. These peripheral zones 310, 320 are designed to be joined together in leaktight manner, e.g. by a heat-sealing technique. A volume is thus defined between the two sheets 31 and 32 that serves as a fluid reservoir 30, as can be seen in Figures 2a, 2b, and 2c. One of the sheets, namely sheet 31 in this example, is provided with a dispensing hole 311. Thus, the fluid stored in the reservoir 30 of the pouch 3 can exit from the reservoir through the dispensing orifice 311. Since the sheets 31 and 32 are made of a material that is easily deformable, each of them forms a deformable or movable actuating wall on which it is possible to act to cause the inside volume of the reservoir 30 to vary. By moving them apart, the volume of the reservoir is increased, as shown in Figure 2b, and by moving them together, the volume of the reservoir is decreased, as shown in Figures 2a and 2c. If the sheet 31 is held in fixed manner, sheet 32 is then considered to be the actuating wall of the pouch 3, and vice versa. Advantageously, the reservoir 30 contains a

piece of porous material 33 which is advantageously fixed to the sheet 31 at the dispensing orifice 311. It is even advantageous for the piece 33 to be in direct contact with the orifice 311. The function of the piece 33 is to become impregnated or soaked with the fluid, in liquid or powder form, stored in the reservoir 30 of the pouch 3. The reservoir 30 may contain fluid only, but preferably it contains both the fluid and a gas, e.g. air. Thus, particularly when the pouch contains a piece of porous material 33, the air in the reservoir 30 can be driven out through the piece of porous material 33 filled with fluid when the volume of the reservoir is decreased. This results in a mixture of the fluid and of air being sprayed out through the dispensing orifice 311. By providing spring means for moving the sheet 32 away from the sheet 31, so as to define a maximum reservoir volume, it is possible to use the pouch 3 as an independent fluid dispenser. This applies, for example, to the above-mentioned prior art document FR 2 791 645. However, in the present invention, it is preferable for the pouch 3 not to have spring means internal or specific to it. In other words, it is preferable for the sheets 31 and 32 of the sheet to be freely deformable, and not urged apart or together by spring means of the pouch, even incorporated in or intrinsic to the sheets 31 and 32. For example, it is not necessary for one or both of the two sheets to have shape memory. However, that is not excluded either.

Naturally, it is possible to imagine other embodiments for the pouch 3. The essential point lies in the fact that the pouch 3 defines a reservoir having at least one movable or deformable actuating wall so as to be able to cause the internal volume of the reservoir to vary so as to be able to deliver the fluid that it contains, optionally as a mixture with a gas, through a dispensing orifice. For example, the dispensing orifice

may be formed in a separate part mounted on a sheet or between the two sheets. It is also possible to imagine using other elements to form the casing of the reservoir. For example, it is possible to imagine a support plate to which a deformable or movable membrane is fixed in leaktight manner.

The actuating means which, in this example, are in the form of two plates 1 and 2, serve firstly for varying the internal volume of the reservoir 30 by moving or deforming one sheet relative to the other. The actuating means can also act on the volume of the reservoir so as to increase it and/or so as to decrease it. The actuating means comprise a press zone and a backing zone via which zones the dispenser can be grasped, e.g. with one hand by positioning the thumb on the backing zone and one or more other fingers of the same hand on the press zone or vice versa. By pressing in this way with the hand on the press zone so as to move it towards the backing zone, the volume of the reservoir is caused to vary, either so that it increases or so that it decreases, or indeed so that it is subjected to a consecutive combination of an increase followed by a decrease, or of a decrease followed by an increase.

In the embodiment shown in the figures, and in particular in Figures 1, 2a, 2b, and 2c, the front plate 1 forms the press zone and the backing zone, as explained below. The front plate 1 comprises a front panel 10 defining two opposite side edges 13, a top edge 11, and a bottom edge 12 opposite the top edge. The panel 10 is further provided with a through opening 14 which is disposed substantially centrally in this example. In this example, the top edge 11 is formed by a longitudinal edge that extends substantially perpendicularly to the plane of the panel 10. The edge is then extended by a flap 111 which extends parallel to the plane of the panel

10. The same applies for the bottom edge 12 which is also formed by an edge provided with a flap 121. The two flaps 111 and 121 point towards each other. Thus, two grooves 112 and 122 are formed that are open facing each other. The groove 112 is formed between the flap 111 and the panel 10, and it has an end-wall formed by the edge 11 which forms the top edge of the plate 1. In symmetrical manner, the groove 122 is formed between the flap 121 and the panel 10, and it has an end-wall formed by the edge that defines the bottom edge of the plate 1. In this example, the flaps 111 and 121 extend over the entire width of the plate. However, it is possible to imagine embodiments in which the grooves extend over only a fraction of the width of the plate 1, so that the top edge 11 and the bottom edge 12 occupy only portions of the edges that connect the panel 10 to the flaps 111 and 121. Other portions of the top edge 11 and of the bottom edge 12 can then have the same shape as the side edges 13.

In the invention, the sheet 1 has a certain amount of rigidity, while also having a certain amount of elastic deformability. The sheet can thus be bent or curved elastically by exerting stress between the top edge 11 and the bottom edge 12. It is thus possible to move the edge 11 towards the edge 12 by elastically deforming the panel 10 by curving it. It is almost impossible to deform the plate 1 in the other direction, especially when the flaps 111 extend over the entire width of the plate 1. The flaps 111 and 122 reinforce the rigidity of the plate 1 at the edges 11 and 12. In contrast, since the side edges 13 are not reinforced, it is possible to deform them in flexing or buckling. It is advantageous for the plate 1 to have elastic shape memory so that it always returns to its rest position. As shown in Figure 1, the panel 10 is shown as being exactly

plane. However, it is preferable for the panel 10 to have initial rounding or curvature, as shown in Figure 2a. The initial curvature guarantees that the panel 10 is always deformed in the same direction, namely leftwards in Figure 2a.

The plate 1 may be made of any material, such as, for example, plastic, metal, card, or a laminate of metal, of plastic, and/or of card.

The back plate 2 may be made of the same material as the front plate 1. It may also have the same rigidity and deformability characteristics as the front plate 1. The back plate 2 is in the form of a panel 20 which is substantially plane or slightly curved. The back panel 20 has two side edges 23, a top edge 21 and an opposite bottom edge 22. If the panel 20 is made with a slight curvature, said curvature extends over the height of the panel 20, so that the side edges 23 are curved, while the edges 21 and 22 remain rectilinear. It is advantageous for the curvature of the panel 20 to be in the same direction as the initial curvature of the front panel 10 of the plate 1. The back panel 20 is uninterrupted in this example, but it may also be cut out locally if necessary. Like the panel 10, the panel 20 is entirely smooth in this example, but it is also possible to imagine panels having shaped sections for functional reasons or for reasons of appearance.

The back plate 2 is mounted on the front plate 1 by inserting the bottom edge 22 in the bottom groove 122, and by inserting the top edge 21 in the top groove 112. The height of the back plate 2 as defined by the height of the side edges 23 is advantageously greater than the distance between the end-wall of the bottom groove 122 and the free bottom edge of the flap 111. Thus, the back plate 2 is secured to the front plate 1 and cannot become disengaged from the grooves 112 and 122, since the top

edge 21 of the plate 2 extends beyond the bottom free edge of the flap 111, as can be seen in Figure 2a, even in the rest position. For example, it is possible to engage the plate 2 in the plate 1 by lateral sliding. Once the plate 2 is engaged in the grooves and disposed behind the plate 1, a single subassembly is obtained in which the back plate 2 can nevertheless move by axial sliding and with vertical clearance. It is advantageous for the top edge 21 of the plate 2 not to be in abutment against the end-wall of the groove 112, but rather for there to remain a gap that defines the vertical clearance for the plate 2 behind the plate 1 in the rest position. The bottom edge 22 of the plate 2 may even be fixed in the bottom groove 122. In which case, the plate 2 can no longer slide behind the plate 1, but the top edge 21 of the plate 2 remains free, and the entire clearance is defined between the edge 21 and the end-wall of the groove 112.

Since the front plate 1 and the back plate 2 are elastically deformable to some extent, it is possible to deform the front plate 1 by holding it between its press zone defined by the top edge 11 and its backing zone defined by the bottom edge 12, as can be seen in Figure 2b. Bringing the edge 11 towards the edge 12 firstly deforms the front panel 10 of the plate 1 by accentuating its curvature. During this time, the back plate 2 remains stress-free. The front plate 1 continues to be curved, and the back plate remains stress-free until the top edge 21 of the back plate 2 comes into abutment against the end-wall of the groove 112, as shown in Figure 2b. Since the front plate has accentuated its curvature while the back plate has remained static, the front plate 1 has moved away from the back plate 2 at the opening 14. It can even be observed that the volume

defined between the two plates has increased between Figure 2a and Figure 2b.

By continuing to press on the zone 11 in reaction relative to the zone 12, starting from the position shown in Figure 2b, the back plate 2 starts curving, advantageously in the same direction as the front plate 1. This can be seen in Figure 2c. The two plates being deformed simultaneously results in the back plate 2 being brought closer to the front plate 1 at the opening 14. It can even be observed that the volume defined between the two plates has decreased between the position in Figure 2b and the position in Figure 2c.

Thus, by bringing the press zone 1 closer to the backing zone 12, starting from the rest position shown in Figure 2a, firstly the two plates are moved apart at the opening 14 to reach the position in Figure 2b. Then, by continuing to bring the press zone towards the backing zone, the two plates come closer together again at the opening 14. It should be noted that the two plates moving apart and then back together is generated by a single movement whereby the edges 11 and 12 are brought closer together. In addition, it should also be noted that the zones 11 and 12 are brought together along an axis which is transverse or perpendicular to the axis along which the walls 1 and 2 move at the opening 14. Thus, a force exerted along one axis generates movement along a transverse or perpendicular axis. And this movement generates a variation in distance and in volume between the two plates.

Naturally, it is possible to imagine a variant embodiment, as shown in Figure 3, in which the back plate 2 is made integrally with the front plate 1. The bottom edge 22' of Figure 3 may, for example, be connected integrally to the flap 121'.

In the embodiment shown in Figures 1, 2a, 2b, 2c, and 3, the pouch 3 containing the fluid in liquid or in powder form is disposed between the two plates 1 and 2. The front sheet 1 provided with the dispensing orifice 311 may, for example, be fixed to the front panel 1 around the opening 14. In addition, the back sheet 32 of the pouch 3 may be fixed to the back plate 2 substantially at the dispensing orifice 311. It is preferable for the remainder of the pouch 3 not to be connected to the plates 1 and 2. Advantageously, the dispenser may be provided with a removable closure member 4 which is received in the opening 14 and which closes off the dispensing orifice 311 in leaktight manner. Prior to use, the removable closure member 4 can be removed so as to unmask the dispensing orifice, as shown in Figures 2a and 3. Provision may even be made for the reservoir 30 to contain fluid only, until the removable closure member 4 has been removed. Thus, the reservoir is maintained at a minimum volume so that the back plate 2 is pressed against the front plate 1. After the removable closure member 4 has been removed, air can penetrate into the reservoir 30 through the dispensing orifice 311 and through the piece of porous material 33. The volume of the reservoir 30 can then increase slightly because the back plate can relax to return to its initial rest position shown in Figure 2a or Figure 3. However, it is also possible to make provision for the dispenser to be in the form shown in Figures 2a and 3 when the removable closure member 4 is in place. In any event, after the closure member 4 is removed, the dispenser is in the form shown in Figure 2a or Figure 3. By pressing on the press zone 11 and on the backing zone 12, as shown in Figure 2b, initially the front plate 1 is deformed while leaving the back plate 2 stress-free, so that the front plate 1 moves away from the back plate 2 at the

opening 14 at which the dispensing orifice 1 is situated. Since the front sheet 31 is connected to the front plate 1 and the back sheet 32 is connected to the back sheet 2, the front sheet 31 is pulled away from the back sheet 32, thereby generating an increase in the volume of the reservoir 30. This can be seen in Figure 2b. By continuing to press, the back panel 2 is also deformed so that it moves closer to the front panel 1 at the opening 14. This brings the back sheet 2 closer to the front sheet 31, thereby reducing the internal volume of the reservoir 30. During the stage going from Figure 2a to Figure 2b, air is drawn into the reservoir 30 through the dispensing orifice 311, and then, during the stage going from Figure 2b to Figure 2c, the air sucked in previously is delivered through the dispensing orifice 311 as a mixture with some of the fluid contained initially in the reservoir 30. Thus, in a single actuating action, the reservoir is firstly filled with air, and then the air is expelled as a mixture with fluid from the reservoir. This takes place without pressing directly on the actuating wall(s) of the reservoir. On the contrary, a press zone and a backing zone are used that are remote from the actuating walls of the reservoir, which makes it possible, during a single common actuating action, to increase or to decrease the volume of the reservoir, or both to increase and to decrease the volume of the reservoir.

The invention thus should not be considered merely as lying in the capacity to increase and then to decrease the volume of the reservoir by acting on press and backing zones that are connected indirectly to the actuating walls of the reservoir. The invention may also be seen to lie in the possibility of increasing the volume of the reservoir by acting on press and backing zones along an axis that is transverse or perpendicular

to the movement of the actuating walls of the reservoir. This corresponds merely to the initial stage going from Figure 2a to Figure 2b.

The invention may also be seen to lie in the possibility of decreasing the volume of the reservoir by acting on press and backing zones along an axis that is transverse or perpendicular to the movement of the actuating wall(s) of the reservoir. This corresponds to the stage going from Figure 2b to Figure 2c.

Naturally, the combination of these stages, namely a stage in which the volume of the reservoir is increased followed by a stage in which the volume of the reservoir is decreased is preferred, because this makes it possible, in a single common action, to generate two opposing and complementary actuating stages.

In a variant embodiment shown in Figure 4, it is possible to omit the pouch 3 containing the fluid, and to use the front and back plates 1' and 2' directly to form the fluid reservoir 30. The top edge 21' of the back plate 2' may be fixed indirectly to the groove 112', or, in a variant, it is possible to provide a flexible link so that the dispenser can also perform the initial stage of increasing the reservoir going from Figure 2a to Figure 2b.

In all of the embodiments, in which the reservoir increases in volume, it is necessary for the back plate 2, 2' to have rigidity and/or elasticity sufficient to enable the front plate to bend without the back plate bending, so as to enable the volume of the reservoir to be increased.

If the back plate is too flexible, it is entrained by the front plate without generating an increase in the volume of the reservoir. The rigidities and/or elasticities of the two plates may be different: for

example, the front plate may be more flexible than the back plate.

As soon as the reservoir has reached its maximum volume, the back plate can start bending with front plate.

By means of the invention, it is possible to obtain a preferably two-phase fluid dispenser that does not have a permanent return spring, and that, when actuated, makes it possible for the volume of the reservoir to be consecutively increased and then decreased.